

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 17 AUG 2005

WIPO

PCT

Applicant's or agent's file reference 85/TY00M26/WO		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/IB2004/002683		International filing date (day/month/year) 18.08.2004		Priority date (day/month/year) 25.08.2003
International Patent Classification (IPC) or national classification and IPC B60L11/18				
Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  17.01.2005		Date of completion of this report  16.08.2005		
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Bronold, H  Telephone No. +49 89 2399- 2348		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/IB2004/002683

---

**Box No. I Basis of the report**

---

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-19 as originally filed

**Claims, Numbers**

1-9 as originally filed

**Drawings, Sheets**

1/6-6/6 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/IB2004/002683

---

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

**1. Statement**

Novelty (N)	Yes: Claims	1-9
	No: Claims	
Inventive step (IS)	Yes: Claims	1-9
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

**PCT/IB2004/002683**

**Re Item V.**

- 1 The following documents are referred to in this communication:

D1 : US 2001/053950 A1 (AOYAGI SATOSHI ET AL) 20 December 2001 (2001-12-20)  
D2 : DE 101 61 965 A (PLUG POWER INC) 11 July 2002 (2002-07-11)  
D3 : EP 1 286 405 A (TOYOTA MOTOR CO LTD) 26 February 2003 (2003-02-26)  
D4 : PATENT ABSTRACTS OF JAPAN vol. 2002, no. 03, 3 April 2002 (2002-04-03) & JP 2001 307758 A (TOYOTA MOTOR CORP), 2 November 2001 (2001-11-02)

- 2 Document D1, which is considered to represent the most relevant state of the art, discloses (the references in parenthesis applying to this document):

A fuel cell system including a fuel cell (figure 1, ref. 11), electric power storing means (figure 1, ref. 12), and electric power supplying means (figure 1, wiring) for supplying electric power to a load from the fuel cell and the electric power storing means, wherein the electric power supplying means includes intermittent operation means (page 4, paragraph 65) for stopping and starting the fuel cell according to a reference value.

From this, the subject-matter of independent claim 1 differs in that:

The fuel cell is stopped when an amount of power required by the load is smaller than a reference value, and the fuel cell is started when the amount of electric power required by the load is equal to or larger than the reference value, wherein threshold value adjusting means are provided for adjusting the reference value according to the internal electromotive force in the fuel cell whose operation has been stopped.

- 2.1 The subject-matter of claim 1 is therefore novel (Article 33(2) PCT)  
The problem to be solved by the present invention may be regarded as:

Improving the response of the fuel cell system.

- 2.2 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

None of the cited documents D1 to D4 discloses to vary the reference value according to the electromotive force of the fuel cell.

Document D1 deals with maintaining the supply voltage of an electrical vehicle within an upper and a lower limit of a hysteresis.

Document D2 discloses not to modify the controlling of the fuel cell as long as the power requirement is kept within a certain hysteresis.

Document D3 is directed to efficiently using a fuel cell by storing outputted power during low power demand zones into a capacitor.

Document D4 teaches to start and stop a fuel cell system depending on the power demand of a vehicle.

Thus, there is no indication given in the cited documents D1 to D4 which would lead the skilled person towards varying the reference value according to the electromotive force of the fuel cell.

- 2.3 Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

- 2.4 Claim 8 is directed to a method of using the apparatus according to claim 1. The method steps according to the subject matter of claim 8 represent steps of purposive use of the apparatus features according to claim 1. Therefore, the above reasoning with respect to the subject matter of claim 1 applies mutatis mutandis to the subject matter of claim 8.

Consequently, the subject matter of claim 8 is considered as new (Article 33(2)PCT) and involving an inventive step (Article 33(3) PCT).

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

**PCT/IB2004/002683**

- 2.5 Claim 9 is dependent on claim 8 and as such also meets the requirements of the PCT with respect to novelty and inventive step.